

Notes on the genus *Gamelia* HÜBNER, 1819 (“1816”), with descriptions of new species (Lepidoptera, Saturniidae, Hemileucinae)

Stefan NAUMANN

Dr. Stefan NAUMANN, Hochkirchstrasse 71, D-10829 Berlin, Germany; sn@saturniidae.com

Abstract: *Gamelia lampei* sp. n. from Bahia State, Brazil, *Gamelia herbini* sp. n. from Morona-Santiago Province, Ecuador Oriente, and *Gamelia centralis* sp. n. from Cajamarca and Amazonas Departamentos, Peru, are described, figured and compared with other taxa of the genus. All holotypes (males) from the author's collection will be deposited in Zoologisches Museum der Humboldt-Universität zu Berlin, Germany.

Key words: Saturniidae, *Gamelia*, *lampei*, *herbini*, *centralis*, new species, Brazil, Peru, Ecuador.

Bemerkungen zur Gattung *Gamelia* HÜBNER, 1819 (“1816”), mit Beschreibung neuer Arten (Lepidoptera, Saturniidae, Hemileucinae)

Zusammenfassung: *Gamelia lampei* sp. n. aus dem Bundesstaat Bahia, Brasilien, *Gamelia herbini* sp. n. aus der Provinz Morona-Santiago, Ost-Ecuador, sowie *Gamelia centralis* sp. n. aus den Provinzen Cajamarca und Amazonas, Peru, werden beschrieben, abgebildet und mit anderen schon bekannten Arten der Gattung verglichen. Alle drei männlichen Holotypen gelangen aus der Sammlung des Autors an das Zoologische Museum der Humboldt-Universität zu Berlin.

Observaciones acerca del género *Gamelia* HÜBNER, 1819 (“1816”), con una descripción de nuevas especies (Lepidoptera, Saturniidae, Hemileucinae)

Resumen: *Gamelia lampei* sp. n. del estado federal de Bahía, Brasil, *Gamelia herbini* sp. n. de la provincia de Morona-Santiago, Ecuador Oriente, así como *Gamelia centralis* sp. n. de las provincias Cajamarca y Amazonas, Perú, son descritas, ilustradas y comparadas con otras especies ya conocidas del género. Los tres holotipos machos serán trasladados de la colección del autor a las colecciones del Zoologisches Museum der Humboldt-Universität en Berlín.

Introduction

Historically, the genus *Gamelia* HÜBNER, 1819 (“1816”) was usually listed as a synonym of *Automeris* HÜBNER 1819 (“1816”) (e.g. CONTE 1906: 109 ff., DRAUDT 1929: 746 ff., BOUVIER 1929: 259, 1936: 46 ff.), and was elevated from synonymy by MICHENER (1952: 432) with a redescription of the genus, followed by all other authors since. The genus is composed by small to medium sized species characterized by brown and quite homogenous forewings, presence of an typical eyespot with red iris and dark outer ring on the dorsal hindwing and typical ♂ genitalia structures, which are symmetrical, showing short valves with an internal dorsal process, and often strong sclerotized or very long processes of the juxta, and typical structures of the 8th tergite and sternite. In his revisions and checklist LEMAIRE (1974: 468, 1996: 40, 2002: 304) counted 20 species for *Gamelia* which are widely distributed from Mexico to south-eastern Brazil and northern Argentina. Since LEMAIRE's work 4 further

species were described: *Gamelia longispina* NAUMANN, BROSCH & WENCZEL, 2005, *G. dargei* NAUMANN, BROSCH & WENCZEL, 2005, *G. vanschaycki* NAUMANN, BROSCH & WENCZEL, 2005, all three from Peru, and *G. cimarrones* DECAËNS, BONILLA & RAMIREZ, 2005 from Colombia.

In the following 3 further species from Brazil, Ecuador and Peru, respectively, are described as new.

Gamelia lampei sp. n.

Holotype ♂: Brazil, Bahia, Rte. BR116-Encruzilada, km 34, 600 m, 2. III. 1997, leg. Thierry PORION, via Rudolf LAMPE, coll. Stefan NAUMANN; a red holotype (= HT) label will be added. The holotype will be deposited in the collections of Zoologisches Museum der Humboldt-Universität zu Berlin (= ZMHU).

Paratypes: 2 ♂♂, same data as HT, 1 genitalia prep. (= GP) no. 2229/11 NAUMANN. One specimen will be donated to Carlos C. G. MIELKE (Carambeí, Brazil), the second one remains in the collection of the author.

Derivatio nominis: The taxon is named in honour of Rudolf E. J. LAMPE, Nürnberg, in recognition of his work on the preimaginal instars of worldwide Saturniidae; he also donated the material to the author. Rudolf LAMPE regrettably died on July 12th, 2011.

Description and diagnosis

♂ (Fig. 1 dorsal, Fig. 2 ventral): Head dark brown; labial palpi same colour; antennae ochreous brown, 6.5 mm in length, maximal ramus length 1.2 mm, quadripectinate. Body: thorax dark brown dorsally, more ochreous to reddish brown ventrally; legs dark greyish brown; abdomen dark brown dorsally and reddish brown ventrally. Forewing length, measured in a straight line from basis to apex, 22.0–22.5 mm; the wing is quite round, convex at costal and outer fringe, and has a small apical acute tip; dorsal ground colour dark greyish brown, antemedian line indistinct, centrally a hinted small and round discocellular spot with pink centre, circled with a fine black line. Postmedian line fine, straight and little darker brown, postmedian area lighter brown than ground colour, submarginal band concolorous. Hindwing lighter, more greyish brown, the anal region with abundant dark brown hair-like scales. Hindwing ocellus large, round, diameter 6.5–7.0 mm, with black periocellar ring, iris dull red, pupil pink with black central spot. Postmedian line bent around ocellus, dark brown, followed by a broader submarginal band of same colour. Ventral side homogenous reddish brown, the only markings are the black forewing discocellular spot which is suffused with some pink scales centrally, a white discocellular spot on the hindwing, and little darker, hinted postmedian lines on both fore- and hindwings.

♂ genitalia (Fig. 7; GP no. 2229/11 NAUMANN): Uncus rectangular, with two apical tips. Juxta with two lateral strongly bent spines. Valves with a ventral process covered with lots of bristles, and a dorsal one, round, without any bristles. From there emerges to the right and left central an inner process which is strongly sclerotised and bent to dorsal direction. Phallus short, straight, vesica emerging to ventral side. 8th sternite almost rectangular, with two central long and narrow processes.

♀ and preimaginal instars remain unknown.

Diagnosis: *G. lampei* cannot be confused with any other taxon in the genus due to the combination of the following characters: very small size, the unique black dot in the pink pupilla of the hindwing ocellus, and the typical form of the 8th sternite. There occur other very small *Gamelia* species in Brazil, such as *G. remissa* (WEYMER, 1907), *G. remissiodes* LEMAIRE, 1967, or *G. pygmaea* (SCHAUS, 1904) which all differ already superficially and also by their ♂ genitalia structures (see in LEMAIRE 2002: figs. 35 ff.).

Gamelia herbini sp. n.

Holotype ♂: Ecuador Oriente, Morona-Santiago, Mendez-Morona, km 75, 600 m, 14. viii. 1990, leg. D. HERBIN & J. HAXAIRE, coll. Stefan NAUMANN, GP no. 2230/11 NAUMANN; a red HT label will be added. The HT will be deposited in ZMHU.

Paratype: 1 ♂, Ecuador Oriente, Morona-Santiago, route Mendez à Morona, km 30, 700 m, 27. vii. 1990, leg. D. HERBIN & J. HAXAIRE, BC-Her 3199, in coll. D. HERBIN, Pechabou.

Derivatio nominis: The taxon is named in honour of Daniel HERBIN, who kindly donated the HT to the author.

Description and diagnosis

♂ (Fig. 3 dorsal, Fig. 4 ventral): Head dark brown; labial palpi same colour; antennae light ochreous brown, 6.8 mm in length, maximal rami length 1.4 mm, quadripectinate. Body: thorax dark violet brown dorsally, orange to reddish brown ventrally; legs dark greyish brown; abdomen dark brown dorsally and reddish brown ventrally. Forewing length 26.0 mm; the wing is a little convex and has a small apical tip; dorsal ground colour dark violet brown, antemedian line broken, composed by yellow scales, the median area lighter, centrally a small and round discocellular spot with bluish ring and ochreous centre, circled with a fine black line. Postmedian line fine, straight, to the median area consisting of bluish scales, marginally of yellow ones, in the costal part curved backwards. Postmedian area lighter brown than ground colour, with some submarginal patches of violet scales. Hindwing little lighter, more greyish brown. Hindwing ocellus ovoid, diameter 6.2 mm, with black periocellar ring, dull red iris and white pupil. Postmedian line somewhat unique for the genus, composed only by one whitish line which ends at the upper wing angle and is not curved backward to the wing base. Submarginally some bluish patches. Ventral side of the forewing homogenous greyish brown, only markings

are the dark grey forewing discocellular spot which is suffused with some black scales centrally, and the dark brown and white postmedian line. Ventral hindwing more reddish brown, with orange discocellular spot with black centre, and straight white and brown postmedian line; postmedian area darker, the veins of the hindwings indicated as yellow lines.

♂ genitalia (Fig. 8, GP no. 2230/11 NAUMANN): Uncus broad-based, rounded, juxta with two rounded ventral lobes and, further dorsal, two lateral spine-like processes which are bent backward. Valves with a long round ventral process with lots of bristles, and a round dorsal one without any. From there emerges an internal process which is heavily sclerotised and dentate in its apical part. Its tip is bent to dorsal side. Phallus ca. 2 mm long, bent, vesica emerging ventrally. 8th sternite round, distal parts strongly sclerotised, with two short round tips centrally.

♀ and preimaginal instars remain unknown.

Diagnosis: Main diagnostic feature of *G. herbini* is the typical postmedian line of the hindwing which is not bent around the ocellus as in all other *Gamelia* species, but which ends, only slightly bent, at the upper outer margin, and the combination with a straight forewing postmedian line plus typical structures of the 8th sternite. Aside from the hindwing pattern it looks somewhat similar to *G. abas* (CRAMER, 1775) and *G. abasia* (STOLL, 1781) from which it differs by the ♂ genitalia structures and 8th sternite (compare again LEMAIRE 2002: figs. 34 ff.), and from *G. pyrrhomelas* (WALKER, 1855), described from Colombia, which is larger and has a different hindwing ornamentation plus different structures of the genitalia and 8th sternite.

Gamelia centralis sp. n.

Holotype ♂: Peru, Dept. Cajamarca, Cutervo, 1950 m, x.-xi. 2006, leg. local collectors, bought ii. 2007 from Rainer MARX, coll. Stefan NAUMANN, GP no. 2231/11 NAUMANN; a red HT label will be added. The HT will be deposited in ZMHU.

Paratype: 1 ♂, Peru, Dept. Amazonas, El Paraiso, Pomacochas, 2100-2600 m, xi.-xii. 2006, leg. local collectors, bought ii. 2007 from Rainer MARX, coll. Stefan NAUMANN.

Derivatio nominis: The name derives from the origin of the type material, the Cordillera Central in northern Peru. While Cutervo is located in the western slopes, Pomacochas is in the eastern slopes of this mountain chain. Thereby *G. centralis* may also be distributed further within north-south direction at similar altitudes.

Description and diagnosis

♂ (Fig. 5 dorsal, Fig. 6 ventral): Head dark brown; labial palpi same colour; antennae dark ochreous brown, 8.0-8.5 mm in length, maximal rami length 1.5 mm, quadripectinate. Body: thorax dark reddish brown dorsally, more ochreous to orange brown ventrally; legs dark brown; abdomen dark brown dorsally and orange brown ventrally. Forewing length 28.5-31.0 (HT) mm; the wing is more rectangular, outer margin a little convex, and has a short apical elongated tip; dorsal ground colour



Plate: Gamelia specimens and ♂ genitalia. **Figs. 1–2:** *Gamelia lampei*, ♂ HT. **Fig. 1:** dorsal view; **Fig. 2:** ventral view. **Figs. 3–4:** *Gamelia herbini*, ♂ HT. **Fig. 3:** dorsal view; **Fig. 4:** ventral view. **Figs. 5–6:** *Gamelia centralis*, ♂ HT. **Fig. 5:** dorsal view; **Fig. 6:** ventral view. — Specimens to the same scale, scalebar 0.5 mm. — **Fig. 7:** *G. lampei*, ♂ genitalia, no. 2229/11 NAUMANN. **Fig. 8:** *G. herbini*, ♂ genitalia, no. 2230/11 NAUMANN. **Fig. 9:** *G. centralis*, ♂ genitalia, no. 2231/11 NAUMANN. — Genitalia to the same scale, with 8th sternites (below phallus) at differing scale. — Photos of specimens S. NAUMANN, photos of genitalia J.-P. KOPELKE & W. A. NÄSSIG (sternites).

dark brown, antemedian line almost indistinct, slightly indicated by some ochreous scales; centrally a hinted small and rounded discocellular spot with pink centre, circled with a fine black line. Postmedian line fine, bent a little concave to the apical part of the costa, darker brown followed by ochreous scales, postmedian area lighter brown than ground colour, with a shadow in ground

colour following the postmedian line; outer fringes yellow in lower half and dark brown in apical half of the wing. Hindwing much lighter, reddish brown, hindwing ocellus slightly ovoid or round, diameter 6.0–7.2 (HT) mm, with broad black periocellar ring, iris carmine red, pupil white. Postmedian line bent around the ocellus, dark black, followed by a broader submarginal band of same

colour. Outer margin more greyish, fringes inverse to the forewing, in the apical part yellow and the lower part dark brown. Ventral side homogenous orange brown, the forewing little more greyish than the hindwing; the only markings are the black forewing discocellular spot which is suffused with some pink scales centrally, a light orange discocellular spot on the hindwing with black central spot, and whitish postmedian lines on both fore- and hindwings.

♂ genitalia (Fig. 8, GP no. 2231/11 NAUMANN): Uncus trapezoid, juxta with two long, but hardly sclerotised lateral processes. Valves with long rounded ventral process and short rounded dorsal one, both with bristles. The internal process strong, heavily sclerotized, bent to dorsal side, and hardly dentate to ventral side. Phallus ca. 2.7 mm long, bent, vesica emerging ventrally. 8th sternite with two short and broad-based central processes and two lateral prolonged round processes.

♀ and preimaginal instars remain unknown.

Diagnosis: *G. centralis* stands somewhat alone in the genus by its combination of pattern and genitalia structures. It shares the reddish brown ground colour with black ornamentation with the Peruvian *G. abasiella* LEMAIRE, 1973, but is much bigger, has the punctate ornamentation of the outer margin missing, and has different ♂ genitalia and 8th sternite structures. *G. neidhoeferi* LEMAIRE, 1967, *G. viettei* LEMAIRE, 1967, and *G. pyrrhomas*, all occurring also at higher altitudes, similar to *G. centralis*, differ by their different ornamentation, reddish instead of carmine hindwing ocellus, darker forewing colour, and details in ♂ genitalia and 8th sternite (compare LEMAIRE 2002: fig. 35).

Discussion

The 3 *Gamelia* species described here formally would have to be placed in the species-group of *G. abasia* erected by LEMAIRE (1974: 468), caused by their ♂ genitalia structures, which were mainly used as grouping character by LEMAIRE (1974, 2002). Again, as already mentioned earlier (LEMAIRE 2002: 303, NAUMANN et al. 2005: 108 ff.), the form of the 8th sternite appears to be a good specific characteristic; all taxa examined had a stable form of this structure. Therefore, this 8th sternite shape appears to be a good additional diagnostic instrument to separate species in *Gamelia*, in addition to external habitus, ♂ genitalia structure, and habitat.

Of course, within reasonable time tissue samples (legs) of the new taxa will be sent to the barcoding project of the University of Guelph, Canada, to make the barcode fragment of the mitochondrial cytochrome-c oxydase gene, subunit I (= mtDNA COI gene), publically available for further research.

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